# The Patient Problem/Nursing Diagnosis Form: A Computer-Generated Chart Document

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## ABSRACT

*The INFORMM (Information Network For Online Retrieval & Medical Management) patient problem/nursing diagnosis form is a computer-generated, patient record document of information related to identified patient conditions and patient outcomes. These patient and nursing data, accessible online as well as in paper copy, enhance continuity of care by providing, to all authorized clinicians, a list and history of identified patient problems/nursing diagnoses and the patient's status in terms of the achievement of projected patient outcomes. This cumulative, patient-centered documentation facilitates patient care effectiveness and provides mechanisms to capture and retrieve patient and outcome data for quality improvement and research purposes.*

## INTRODUCTION

In a era of cost constraints, patient-centered computing enhances communication of patient data among disciplines, facilitates efficiency and, most importantly, fosters quality patient care. The patient-centered care approach organizes diagnostic activities and care protocols based upon the particular patient's needs [1]. Computerized patient records which focus upon patient problems/nursing diagnoses can demonstrate linkages between patient conditions, interventions and outcomes.

The American Nurses' Association (ANA) encourages nurses in the development of Nursing Information Systems (NISs) that support the nursing process [2,3]. Criteria for automated systems that facilitate this process include capabilities to accommodate the following nursing data elements: (1) assessment data, (2) nursing diagnoses with etiologies, (3) interventions for each problem, (4) outcomes for each problem, and (5) progress notes detailing an evaluation of the care plan and actual patient outcomes [4]. However, a review of an 18-year span of development of six NISs revealed that only one allowed charting against care plans whereas four accommodated recording vital signs [5]. This focus on task fulfillment charting gives the appearance that nurses' responsibilities suit a technical rather than professional model of nursing [6].

Furthermore, the recent effectiveness initiative of the Health Care Finance Administration (HCFA) magnifies the need for automated systems to provide data for patient outcomes research [7]. It therefore behooves system designers to create information systems that are patient-centered and, through the online documentation of clinicians, provide the data required to investigate patient care effectiveness.

## THE UNIVERSITY OF IOWA HOSPITALS AND CLINICS (UIHC)

The UIHC is a 891-bed tertiary level health care facility providing services to approximately 2,500 patients each day. The most recent annual data reveal more than 465,600 ambulatory care visits and 28,400 acute inpatient admissions. Of the hospital staff complement of 7,560 members, the Department of Nursing includes 1,500 registered nurses, 55 clinical nursing specialists, 80 licensed practical nurses and 330 nursing assistants.

At the UIHC, the INFORMM system operates on an IBM 3090-500J with 126 billion characters of online storage. A locally distributed network contains 1,100 cathode ray terminals (CRTs), 200 personal computers (PCs), and 200 terminal printers which includes IBM 3812 page printers installed on the inpatient care units to produce chart quality documents on demand. While the daily transaction volume on INFORMM exceeds 1.3 million, the average response time is less than 0.2 seconds.

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## INFORMM NURSING INFORMATION SYSTEM (NIS)

Developed entirely in house at UIHC, the INFORMM NIS was implemented in 1988. The INFORMM NIS encompasses interdisciplinary communication of individualized patient care based upon current professional standards of care [8]. In the patient care planning component of the NIS, patient critical data, patient problems/nursing diagnoses, and patient care orders are entered and updated. The patient care planning data generate the patient acuity profile as a system by-product. Maintained by nursing personnel, the NIS data base contains content specific to patient populations, patient care units, and therapeutic modalities.

The INFORMM NIS is being developed and implemented in three major phases. In Phase I, Patient Care Planning was installed on 41 general inpatient care units. Currently, Phase II: Patient Care Documentation is being designed and established on the same general inpatient care units. Phase II involves revision of documentation practices as well as replacement of existing manual documentation and creation of new chart forms. Following an integrated and logical development plan, each computer-generated chart document is being designed, piloted, and implemented separately.

At this time, two computer-generated chart documents are in use: the patient problem/nursing diagnosis form, and the patient discharge referral form [9]. During Phase III of the INFORMM NIS, Patient Care Planning and Documentation will be enhanced and implemented on the ambulatory care units.

Available to more than 2,350 nursing users, INFORMM NIS functions account for an average of 50,000 transactions daily. Of these transaction totals, approximately 8,000 relate to problem/nursing diagnosis functions which are accessible to nearly 1,000 registered nurses and generate 300 patient problem/nursing diagnosis chart forms daily. The patient discharge referral functions, available to 1,200 nursing users, account for approximately 3,000 transactions and 230 patient discharge referral chart forms per day.

## PATIENT PROBLEM/NURSING DIAGNOSIS FUNCTIONS

Reflecting UIHC Department of Nursing policy, the patient care plan must be initiated for a patient admitted for greater than 24 hours. Although policy requires that a patient be assessed by a registered nurse, it does not mandate that a patient problem/nursing diagnosis be identified. However, for each identified patient problem/nursing diagnosis, the registered nurse must audit, i.e., evaluate, the patient's progress toward outcome achievement at least every six days and at discharge.

The content data elements contained in the problem/nursing diagnosis functions are:

- problem/nursing diagnosis number (assigned chronologically at the time of computer entry);
- problem/nursing diagnosis name (label from the data base of more than 900 or entered free-text);
- defining characteristics (signs and symptoms from a table of more than 940 or entered free-text);
- etiologies/related factors (causes/contributing factors from a table of more than 910 or entered free-text);
- patient outcomes (patient behavior statements from a table of 330 or entered free-text); and
- patient care orders (assessments and interventions from a data base of more than 3,000 or entered free-text).

## PATIENT PROBLEM/NURSING DIAGNOSIS PRINTOUTS

In the INFORMM NIS care planning system, two printouts contain problem/nursing diagnosis data: the care plan problem list and problem/nursing diagnosis/order sheet. The care plan problem list contains the patient's active problems/nursing diagnoses with the associated etiologies/related factors, projected patient outcomes, and several dates: date activated, audit due date and last audit date. Additionally, the initials of the registered nurse who completed the "add" and last "audit" functions are printed.

The second printout contains similar information as well as associated defining characteristics and a compilation of associated patient care orders. These different printouts attest to divergent patient care delivery systems. The care plan problem list and separate order sheet are useful in organizing care to reflect distinctions in the care provided by different levels and functions of nursing staff, whereas the

problem/nursing diagnosis/order sheet is preferred by nursing staff who conduct problem-focused care planning and documentation.

However useful these printouts are, neither suffices as official documentation in the patient record. Therefore, the computer-generated patient problem/nursing diagnosis form was created.

## PATIENT PROBLEM/NURSING DIAGNOSIS FORM: OBJECTIVES

The objectives for the patient problem/nursing diagnosis chart form were:

1) to generate a patient record form to replace manual recording of all patient problem/nursing diagnosis activity from problem identification to problem resolution;

2) to facilitate manual review and retrieval of patient problem/nursing diagnosis and patient outcome data in the paper patient record;

3) to facilitate continuity of care by providing an online display of the patient problem/nursing diagnosis history to authorized members of the health care team;

4) to enhance patient outcome achievement by providing capabilities to review previous clinical notations and reactivate patient problems/nursing diagnoses; and

5) to capture patient problem/nursing diagnosis and patient outcome documentation for quality improvement, and clinical and administrative research.

## PATIENT PROBLEM/NURSING DIAGNOSIS FORM: IMPLEMENTATION

As occurred with the implementation of the patient care planning system, the patient problem/nursing diagnosis chart form was implemented on the general inpatient care units in three waves: a pilot on one unit, an expanded pilot on nine additional representative units, and finally, hospital-wide implementation. Prior to system activation on a unit, registered nurses were provided a one-hour educational session. Although "hands-on" training was not indicated since the "print" was the only new function, the registered nurses were provided a review of the enhanced problem/nursing diagnosis functions.

## PATIENT PROBLEM/NURSING DIAGNOSIS FORM: CHART DOCUMENT

The patient problem/nursing diagnosis chart form is divided into three sections: the list, the discharge audit summary, and the history. For the current inpatient stay, the list contains all the patient problems/nursing diagnoses--first the active, then the inactive patient conditions. For each identified patient problem/nursing diagnosis, the date and name of the registered nurse who added and last audited or inactivated the patient problem/nursing diagnosis are included.

Following this list, the discharge audit summary is printed. In this section, the registered nurse documents the patient's overall health status and outcome achievement at the time of discharge. Obviously, this section does not appear on the patient record form until the registered nurse has completed the discharge audit online.

Following the list and, at discharge, the discharge summary, a complete history of each active and inactive patient problem/nursing diagnosis is printed in chronological sequence, beginning with problem number 1. The history contains the name of the patient problem/nursing diagnosis with associated etiologies/related factors and projected patient outcomes as well as the results of each update and audit. Audit data indicate whether the patient met the projected outcomes and include the registered nurse's free-text comments about the patient's status.

## PATIENT PROBLEM/NURSING DIAGNOSIS FORM: EVALUATION OF OBJECTIVES ACHIEVEMENT

The automated patient problem/nursing diagnosis form has achieved its stated objectives and the registered nurses report that documentation of patient problems/nursing diagnoses has improved.

### Automated Patient Record Form

The automated patient problem/nursing diagnosis chart form replaces all forms of manual documentation detailing the registered nurse's assessment and evaluation of the patient's status in terms of identified clinical conditions. In the

previous manual system, the majority of patient problem/nursing diagnosis documentation was entered in chronological sequence on narrative nurses' notes interspersed with other notations. In some instances, these particular notes were preceded by a heading of the germane patient problem/nursing diagnosis. Also, a separate chart form--the patient problem list--was available to provide an overview of the entire set of patient problems/nursing diagnoses.

In addition to replacing manual documentation, the computer generation of the patient record form has been accompanied by an increase in the number of patient problems/nursing diagnoses identified for each patient. In 1988, a study was conducted which compared the number of patient problems/nursing diagnoses in the manual system (one month prior to the installation of Patient Care Planning) with those identified six months post-implementation.

In the manual system, 91% (eighty two of the ninety patient records) had zero patient problems/nursing diagnoses and zero records had two patient problems/nursing diagnoses. Six months post-implementation, 88% (71 of the 81 patient records) had zero patient problems/nursing diagnoses, 9% had one, and 3% had two.

Subsequent analysis of archived data reveal that the percentage of patients with any patient problems/ nursing diagnoses identified decreased from 69% in 1989 to 63% in 1990. With the automation of the record form in June 1991, the percentage rose to 82% and to 93% in 1992. From January to July 1993, the percentage increased to 94.5% with a shift in the mode of patient problems/nursing diagnoses from one to two per patient record.

Although policy still did not require it, the identification of patient problems/nursing diagnoses did increase with the implementation of Patient Care Planning. However, the achievement of greater than 90% fulfillment occurred only after the computer generation of the patient record form.

**Cumulative Patient Record Form**

In addition to eliminating manual documentation, the computer-generated patient problem/nursing diagnosis chart form enhances manual review and retrieval of associated clinical notations. In contrast to the manual method, one patient record form contains all data pertaining to the history of identified patient problems/nursing diagnoses and the status of patient outcome achievement. Moreover, this cumulative patient record form contains all previous data as well as the most recent updates. In this manner, the new chart form replaces the previous version thereby reducing paper bulk in the patient record.

**Continuity of Care**

Available to all authorized health care team members in inpatient and ambulatory care settings, the online display of the patient problem/nursing diagnosis documentation enhances the continuity of care both before and after hospital inpatient stays. Also, during an inpatient stay, the patient problem/nursing diagnosis data are transferred when the patient moves to a different unit.

In addition, the list of active patient problems/ nursing diagnoses is included in the patient discharge referral form. In this way, the patient problem/nursing diagnosis information facilitates continuity of care with receiving agencies and facilities.

**Patient Outcome Achievement**

The patient problem/nursing diagnosis functions provide capabilities to review all previous germane clinical notations and to copy a prior note when documenting patient status. In this way, registered nurses are reminded of the patient's previous outcome status and may minimize free-text data entry by copying and updating pertinent prior comments. Moreover, any inactive patient problem/nursing diagnosis may be reactivated at any time, thereby retaining the previous problem/nursing diagnosis number and providing congruency within documentation.

**Quality Improvement and Research**

The capabilities to store and retrieve patient problem/nursing diagnosis data are identical to those for care planning data. Patient and nursing data are retained online for 42 days post-discharge, then transferred to an archival file. With requisite approvals, quality improvement studies and clinical and administrative research can be conducted on the active and archived data.

With the automation of the patient record form, the documentation of clinical data related to patient problems/nursing diagnoses and patient outcomes has been captured. Stored in the nursing archive, these data can be retrieved and analyzed in order to conduct outcomes effectiveness research. These analyses for patients and patient populations are greatly facilitated by the ready availability of data

concerning the efficacy of nursing interventions and clinical treatments.

## SUMMARY

In addition to achieving the stated objectives, the INFORMM patient problem/nursing diagnosis online documentation and computer-generated patient record form have satisfied the criteria for a computer system design that supports the nursing process and professional nursing practice. Moreover, the patient-centered focus of documentation enhances patient care delivery as well as capturing clinical data critical to the examination and provision of quality patient care.

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